Mills (C. K.) & De Schweinitz (G. E.)

The Association of Hemianopsia with Certain Symptom-Groups, Chiefly with Reference to the Diagnosis of the Site of the Lesion.

BY

CHARLES K. MILLS, M.D.,

AND

G. E. DE SCHWEINITZ, M.D.

REPRINTED FROM

THE PHILADELPHIA HOSPITAL REPORTS, VOL. III.

1896.

THE ASSOCIATION OF HEMIANOPSIA WITH CERTAIN SYMPTOM-GROUPS, CHIEFLY WITH REFERENCE TO THE DIAGNOSIS OF THE SITE OF THE LESION.

By CHARLES K. MILLS, M.D.,

AND

G. E. DE SCHWEINITZ, M.D.

HEMIANOPSIAS of intracranial origin are naturally first subdivided into (1) those due to lesions involving the optic tracts and primary optic centres; and (2) those due to lesions either of the visual cortex or of the internal capsule and subcortex.

Our remarks will be chiefly confined to strictly cerebral cases. These are of practical interest because of their comparatively frequent occurrence. They can be readily distinguished from the basal and peripheral cases; with less readiness, perhaps, but still as certainly, the subcortical can be separated from the cases of strictly cortical origin.

We have to present, first, a series of cases which, in their main features, correspond to a group of three cases described by Seguin,[1] in which lateral hemianopsia was one of a considerable group of what might be called hemisymptoms. Summarized, Seguin's three cases were as follows:

CASE I. had a history of constitutional syphilis, and developed without an apoplectic attack, right hemiparesis, right hemianæsthesia and aphasia. Examination showed ataxic aphasia, alexia, with partial right-sided paralysis and anæthesia, and right lateral hemianopsia, the vertical line passing to the right of the point of fixation. His handwriting was awkward, and the hand and forearm exhibited, on voluntary effort, well-marked ataxic-choreic movements. Near the median line of the darkened half fields was a zone of imperfect vision.

CASE II.—A man, aged sixty-two years, had an attack of hemiplegia and incomplete aphasia, with marked hemianæsthesia. He spoke much, but miscalled things. Vision was imperfect to the right. He improved greatly, but was left with very

[1] Jour. Nerv. and Ment. Dis., vol. xiii, No. 8, August, 1886, p. 446.

slight right-sided paresis, awkwardness, ataxic movements of the right hand and foot, marked tactile and caloric anæsthesia of the right hand, loss of muscular sense, and incomplete homonymous (or lateral) hemianopsia, the right fields being darkened. Occasionally, he used a wrong word. He could see letters and numerals, but could not read except by a laborious process of spelling. Seguin regarded it as a blindness for words, or rather for the images or concepts which words represent.

CASE III. was a man, aged twenty-six, with probable syphilis and history of apoplectic attack, from the first effects of which he decidedly improved. Examination showed partial right hemiparæsthesia and hemiparesis of the right upper extremity, with marked ataxia during volitional movements. He had right lateral hemianopsia, not quite reaching the point of fixation; about one-third of each visual field was obscured, and two-thirds of each half field.

Seguin regarded these cases as due to lesion of the outer edge of the thalamus, and of the internal capsule in its caudal part.

The five cases which follow correspond with those of Seguin in the presence of hemiparesis or hemiplegia; hemianæsthesia or hemiparæsthesia, partial or complete, and more or less persistent; speech-disturbances more complete at first, and later having the characteristics of an alexia or dyslexia, or a partial word-blindness; and lateral homonymous hemianopsia. The ataxic-choreic movements were not present, or more probably were not studied and described. In two of the cases (Cases I. and IV.), unilateral spasm was present.

The symptoms associated with the hemianopsia and speech disorder, sensory or motor, partial or complete, temporary or persistent, destructive or irritative, are distinct hemisymptoms, varying in degree, probably according to the radiation of the lesion from a common site.

CASE I.—*Right Lateral Hemianopsia—Absence of Wernicke's Symptom—Dyslexia—Temporary Right Hemiparesis—Jacksonian Epilepsy.*—The first case has been already described by us in the proceedings of the Philadelphia Neurological Society.[1] We will, therefore, give the record here in a brief summary:

J. G. H., aged forty-five, had no history of syphilis, but had had two attacks of acute rheumatism. He noticed some failing sight and dizziness in the summer of 1888. December 17, 1888, he had an attack of left brachial monospasm, terminating with unconsciousness, and leaving him partially paralyzed in the right arm and leg, and with a marked affection of speech which lasted two or three weeks. In about three months, he had a second series of attacks of spasm, and after this he noticed he could see only half the objects to his right. He reads in a very peculiar

[1] Jour. Nerv. and Ment. Dis., vol. xv, No. 1, January, 1890, p. 55.

way—slowly, and pronouncing each word separately, or at most two or three words; he seems to have difficulty in seeing the word; he says that he sees it plainly, but that he soon gets mixed and confused. He can write a few words, and then his hands fail to inscribe further letters, while his face gives evidence of chagrin at the abortive attempt. Occasionally, when walking in the street, he imagines he sees something that does not exist—always to the right. Hearing and touch are normal.

The following notes by Dr. de Schweinitz describe his ocular condition:

In the right eye the sharpness of sight was equivalent to $\frac{2}{7}$ of normal; in the left eye $\frac{2}{5}$ of normal. This deficiency in visual acuity was probably due to the presence of a mixed astigmatism.

In the right eye the optic disc was a vertical oval, bounded at its outer margin by a black line, its surface a little woolly, and all the capillaries injected; the edges of the disc, however, were not obscured.

In the left eye the disc was distinctly gray in color, its hue being manifest through a superficial injection of the surface capillaries. The temporal half of the disc was unobscured; the nasal edges slightly blurred. In neither eye was the disc swollen, nor were there any splotches or hemorrhages in the retina.

The pupils of both eyes were equal in size, and reacted normally to the changes of light and shade, convergence and accommodation. The hemiopic pupillary inaction (Wernicke's symptom) was not present in either eye.

There was complete right lateral hemianopsia, the field of the left side being proportionally much smaller than its fellow on the right, and both the preserved fields exhibiting concentric contraction. The dividing line on the left side almost cut the fixing point. That on the right side, on the horizontal meridian, touched the fixing point, while above and below this it spread five degrees from the centre, making a curious re-entering angle.

CASE II.—*Right Lateral Quadrant Anopsia—Absence of Wernicke's Symptom—Dyslexia—Right Hemiparesis—Partial Right Hemianæsthesia—Partial Word-Deafness and Word-Blindness.*

J. B., aged forty-two, a laborer, May 3, 1892, had an apoplectic attack with loss of speech, and was taken to the Hospital of the University of Pennsylvania, where he remained until November, 1892, when he came to the Philadelphia Hospital. He improved slowly. During his stay in the University Hospital, he noticed when he grasped an object with his right hand that he could not release it as promptly as when he seized it with his left.

Examination showed that he was paretic in the right arm, and his field of vision towards the right was decreased. He says that at times he could not understand what was said to him, especially if the person speaking stood to his right. Examination showed paresis of the right forearm, partial right hemianæsthesia, tongue slightly tremulous on protrusion, pointed and deviating a little to the right. He had gradually recovered his speech.

From the first he says he knew what he wanted to say, but could not put it into

such words as would be understood by his hearers. He could recognize objects, but could not pronounce their names. He could not read writing or print because everything ran together; he recognized the letters, but could not pronounce them. He understood sentences, but could not repeat them. He had almost completely recovered from his aphasia, although his voice was a little thick and difficult to understand. One of the most marked phenomena was that which has been described as dyslexia.

The examination of his eyes gave the following results:

R. E.—Oval disc, shallow, dish-like excavation, almost complete. Vessels about normal in size; no fundus lesions.

L. E.—Small, nearly round disc, and small physiological cup. Vessels almost normal in size.

Pupils equal and round; mobility of iris normal; no hemiopic pupillary inaction.

Fields.—Right lateral quadrant anopsia. (See Figs. 1. and 2.)

FIG. 1.

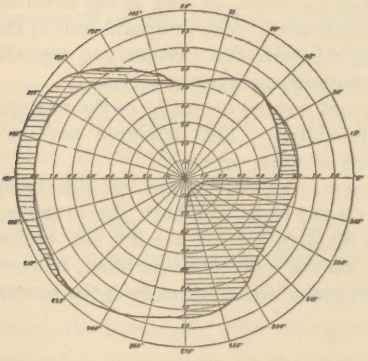
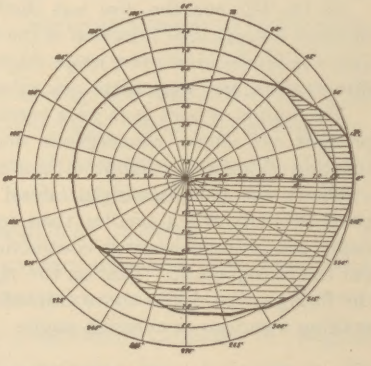


FIG. 2.



Visual fields of Case II. Right quadrant anopsia.

CASE III.—*Right Lateral Hemianopsia—Absence of Wernicke's Symptom—Temporary Aphasia—Dyslexia—Right Hemiparesis of Spastic Type—Probable Word-Blindness.*

W. V., aged fifty-four; in November, 1889, first noticed that when seizing anything with his right hand he could not let it go as soon as he wished. Soon the arm and leg of the same side showed a tendency to rigidity, and became in a month and a half so paretic and spastic that he was unable to walk.

He also, about the same time, became completely aphasic; but he understood everything that was said to him. He was apparently word-blind but not mind-blind. He said of himself: "They showed me things, and I knew what they were, but could not pronounce them." At the end of about three months his speech began to improve.

When examined in November, 1892, he was found to have spastic right-sided hemiparesis without anæsthesia. His tongue on protrusion was slightly tremulous. He recognized objects but hesitated when asked for names, which he could some-

times give. He reads with difficulty, dyslexia being marked, and of much the same character as shown in Case I.

Examination of his eyes by Dr. de Schweinitz gave the following results:

R. E.—Oval disc, faint superficial capillarity, but deeper layers gray. Vessels fuller than usual, arteries contracted; slight epithelial choroiditis.

L. E.—Similar optic disc, but much more gray and both sets of vessels contracted.

Pupils round, 3 mm. in diameter, acting equally and normally to convergence, accommodation and light stimulus; hemiopic pupillary inaction wanting.

Fields.—Typical right lateral hemianopsia, with contraction of the preserved fields. (See Figs. 3 and 4.)

FIG. 3.

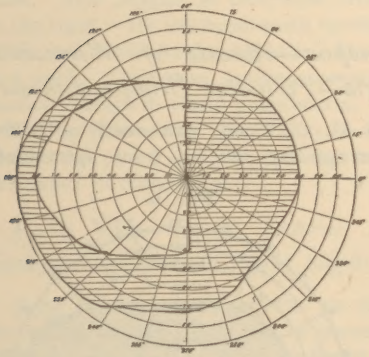
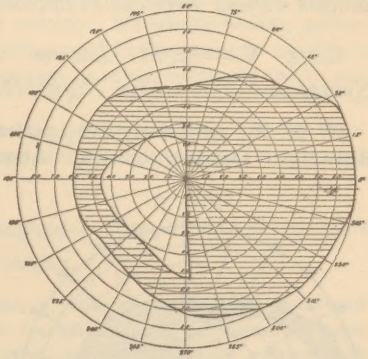


FIG. 4.



Visual fields of Case III. Right lateral hemianopsia.

The symptom described as dyslexia is one of interest, both from the clinical standpoint and in the view of the assistance which it may afford in locating the lesion. Dyslexia, as defined by Swanzy, consists in a want of power on the patient's part to read more than a few words consecutively, either aloud or to himself. Post-mortems have been made in several cases of dyslexia reported by Berlin, and in one recorded by Nieden. The lesions are said to have been found in the white matter near Broca's convolution. Such symptoms would, on general principles, be attributable to partial destruction of the entire centre for word-images, or of the association-fibres which connect this centre with the emissive regions for speech and writing. Most probably the lesion would be an incomplete destruction of commissural-fibres, and hence, subcortical.

CASE IV.—*Left Lateral Hemianopsia—Left Hemiplegia and Hemianæsthesia—Partial Aphasia, Temporary—Epilepsy—Absence of Wernicke's Symptom.*[1]

M. B., aged twenty-eight, after the birth of her last baby had a post-partum hemorrhage, also probably thrombosis of the left femoral vein, from the effects of which she was three months recovering. Three weeks after her labor, she had an apoplectic stroke, with unconsciousness. She was left with hemiplegia and hemianæsthesia of the left side, and with some thickness of speech, which remained for a month. Two weeks after the stroke, she had for the first time a fit, in which she was unconscious, and her entire left side was convulsed; she had a series of convulsions in a period of five hours. She bit her tongue and frothed at the mouth. She has since had, from time to time, attacks of spasm, which begin with vomiting and auditory and visual aura; she has hallucinations of hearing voices, and also has hallucinations of sight; she says that she sees diamonds sparkling.

Examination of her eyes showed disseminated choroiditis and left lateral hemianopsia without Wernicke's symptom.

CASE V.—*Right Lateral Hemianopsia—Absence of Wernicke's Symptom—Temporary Right Hemiplegia—Persistent Hemiparæsthesia.*

G. W. R., aged forty-five; patient of Dr. H. C. Wood; examined by Dr. de Schweinitz October 12, 1889. About a year ago she suffered from right-sided

FIG. 5.

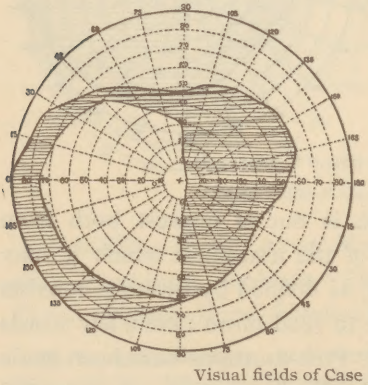
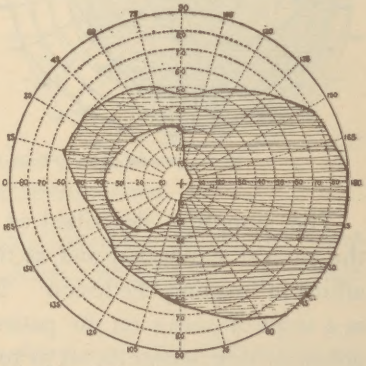


FIG. 6.



Visual fields of Case V. Right lateral hemianopsia.

hemiplegia, which seems to have been temporary, and has been followed by a persistent numbness of that side. Unable to read or use her eyes. Urine contains albumin.

Vision with correcting glass one-half of normal. In the right eye a gray, oval optic disc, with choroidal changes below it of a streak-like character, and fine dot-like changes in the choroid of the macular region; general absorption of the pigment epithelium.

[1] This case was observed in the service of Dr. S. Weir Mitchell, at the Orthopedic Hospital and Infirmary for Nervous Diseases.

In the left eye an irregularly oval disc, gray, and disseminated choroidal changes, especially down and in and below. No changes in the external ocular muscles; Wernicke's symptom absent.

Fields.—Typical right lateral hemianopsia, with contraction of the preserved field, most marked upon the right side. (See Figs. 5 and 6.)

In the next two cases the hemisymptoms are slight and ill-defined, but the hemianopsia is complete and regular, indicating lesions of the optic radiations close to the internal capsule.

CASE VI.—*Right Lateral Hemianopsia—Right Hemiparæsthesia.*[1]

J. P., aged fifty-six, machinist. Seven months before coming under observation, complained of general sensation of numbness on the right side of the body, which the doctor called "la grippe." He also was weak on this side, and found that he could not read. The right-sided numbness has continued until the present time. His tongue is protruded tremulously, and is perhaps slightly pushed to the right. He has been much troubled with vertigo. He admits having gonorrhœa, but denies having syphilis. He has sometimes smoked as many as 200 cigars in a week. Otherwise, nothing special in his history or in the results of the examination, except in visual phenomena.

Dr. de Schweinitz found that he had right lateral hemianopsia without Wernicke's symptom, and with no disturbance of the fundus, and no color-blindness or deficiency in color-sense.

CASE VII.—*Right Lateral Hemianopsia—Absence of Wernicke's Symptom—Doubtful Right Slight Hemiparesis.*

J. S., private patient of Dr. de Schweinitz, a woman, aged fifty, examined November 2, 1891. She was in generally fair health without any severe illness until one year ago, when she suffered from a fever, probably typhoid. Since that time has complained of weakness, and especially of imperfection in vision, being confused when she is walking, particularly going up and down stairs. She believes she has suffered thus for two years, and has not been well since the climacteric, which took place at about that time, a statement that is confirmed by her family physician. There is slight lameness of the right leg, which is somewhat favored in walking. This lameness is said to have improved under anti-rheumatic treatment. There is no anæsthesia, no change in the muscle or knee-jerk, and no disturbance of intellect. There has never been any unconsciousness, convulsions or cerebral symptoms of any type, not even headache.

Central vision, after the correction of a myopic astigmatism, is normal. The external ocular muscles are natural in their action, there being only a slight insufficiency of the internal recti. Each optic disc is a vertical oval, gray in its deeper layers, with some massing of pigment on the nasal side. The retinal vessels are normal in size and carry normally tinted blood. The pupillary reactions are natural, the contraction to light being present, no matter upon which side of the retina the beam is thrown.

[1] This patient was observed in the service of Dr. Wharton Sinkler, at the Orthopedic Hospital and Infirmary for Nervous Diseases.

There is right lateral hemianopsia with much contraction of the preserved fields, the dividing line making a re-entering angle at the fixing point. The field of vision was tested with a piece of white, 1 cm. square. (See Figs. 7 and 8.)

FIG. 7.

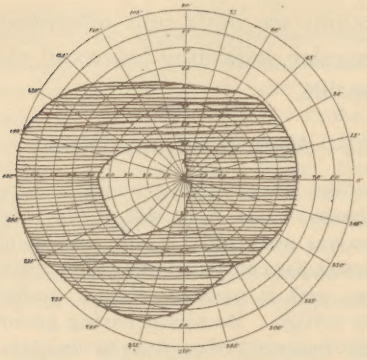
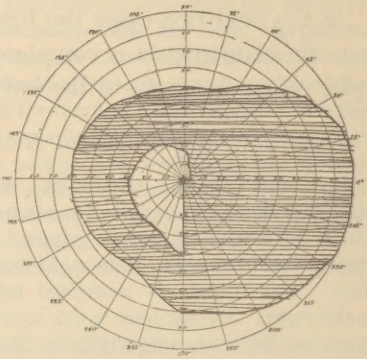


FIG. 8.



Visual fields of Case VII. Right lateral hemianopsia.

CASE VIII.—*Left Lateral Hemianopsia—Absence of Wernicke's Symptom—At First, Paresis of Both Legs—Later, Right Spastic Crural Monoparesis.*[1]

In January, 1892, the patient made an unsuccessful attempt to commit suicide with "Rough on Rats." The next morning he shot himself in the head three times. According to his own statements, twice pointing the pistol to the right parietal region and the third time to the top of the head. He lost consciousness and knew nothing of what was going on for three weeks. When he attempted to walk he found that both legs were partially paralyzed, or at least very weak, the right being more affected than the left. He was also weak and shaky in the arms, but thought that he had no paralysis of the upper extremities. He was told that he had had five or six convulsions while he was unconscious, but he had had none since getting on his feet.

Examination showed spastic paresis of the right leg with exaggerated knee-jerk and muscle-jerk on the right; no anæsthesia. He has a scar in the median line about 9½ inches back from the glabella; another about 11½ inches back, and a third scar and apparent depression about 2½ inches to the right of the median line, between the positions of the other two scars. The most posterior scar is in about the position of the occipital protuberance; and that to the right of the median line is over the position of the occipital lobe.

From the first this patient has complained of greatly impaired vision. Examination showed left lateral hemianopsia, with absence of Wernicke's symptom, and no changes in the fundus or media. (See Figs. 9 and 10.)

[1] This man was a patient in the service of Dr. S. Weir Mitchell, at the Orthopedic Hospital and Infirmary for Nervous Diseases and later in the Polyclinic and Philadelphia Hospitals, service of Dr. Mills; he was, in fact, something of a hospital rounder, having been in various hands in different cities.

In this case the hemianopsia is to the left, the marked spastic paresis to the right. The most probable explanation would seem to be wounding of the right cuneus and cerebral subcortex, and by the same bullet (?) of the motor tract (by fibres) on the left.

It is difficult to distinguish clinically between cortical hemianopsia and that due to limited lesion of the optic radiations in the occipital

FIG. 9.

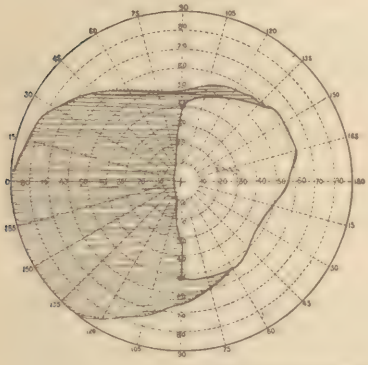
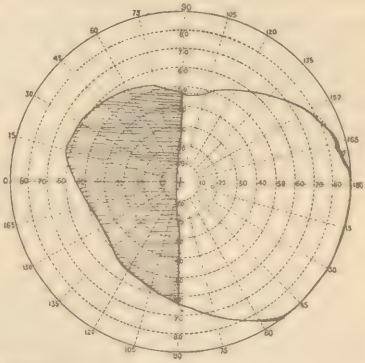


FIG. 10.



Visual fields of Case VIII. Left lateral hemianopsia.

subcortex; but in the latter the hemianopsia is likely to be more typical and regular in character.

The following cases are probably *cortical:*

CASE IX.—*Atypical Left Lateral Hemianopsia.*

J. B., private patient of Dr. de Schweinitz, aged eighty-three, examined December 15, 1890. Has always been a very healthy man, but for three weeks has com-

FIG. 11.

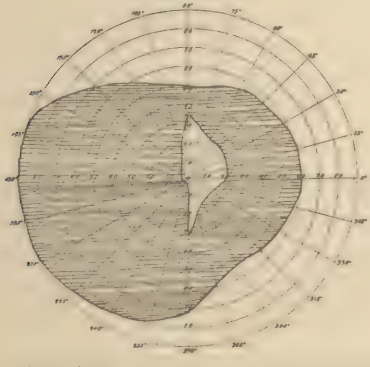
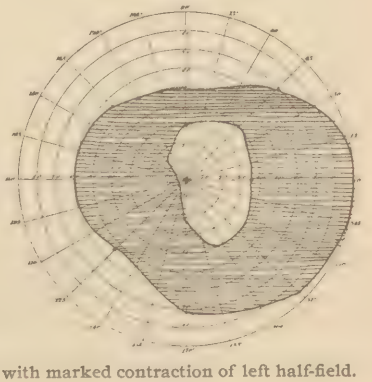


FIG. 12.



Visual fields of Case IX. Left lateral hemianopsia, with marked contraction of left half-field.

plained of failure of sight; no pain; occasional attacks of rheumatism; arteries atheromatous everywhere; urine contains albumin, hyaline and granular tube casts. Vision, 10/C; pupillary reactions sluggish but normal.

Eyegrounds present in moderate degree the appearance of a degenerative type of albuminuric retinitis, the spots of fatty degeneration and fine hemorrhages being chiefly confined to the macula. Few changes occurred, except a slow decrease in the visual power and a moderate increase in the retinitis, indicated chiefly by the appearance of fresh flecks of hemorrhage and the beading of the upper nasal vein.

July 3, 1891, while standing in the sun, was suddenly attacked with a giddy spell, pain in the back of the head and the back, and confusion of ideas. This soon passed away, and he was able to go home unassisted.

The field of vision on the following day presented the character in the diagram, namely, atypical left lateral hemianopsia, the dividing line being somewhat in advance of the fixing point. (See Figs. 11 and 12.) He continued to live as late as December 25, 1891, having had a number of attacks precisely like the one described. After this he was not seen.

CASE X.—*Right Lateral Hemianopsia—Absence of Wernicke's Symptom.*

S. P., a private patient of Dr. de Schweinitz, aged sixty-four, examined December 18, 1891. For six weeks has suffered from subjective and objective vertigo; loses place in reading; some dislocation of thought processes, and fails at times to connect words and sentences. The feeling is described as that of a man who has taken too much wine. There is some loss of sleep, and a great deal of headache, chiefly frontal, and rather more to the right side than the left. This headache is now almost constant, and is described as a pressure rather than a pain.

When examined there was no paralysis, no apparent disturbance of intellect, and, indeed, no marked symptom except the vertigo and the headache.

Central vision normal after the correction of a myopic astigmatism. No palsy of the external ocular muscles. Exophoria, two degrees at twenty feet. Pupillary reactions entirely normal. In the right eye an oval optic disc, gray-red, the nasal edges veiled, and a stripe of glistening tissue across its lower margin. No change in the central vessels. In the left eye a round disc, distinctly gray, the scleral ring too well-marked on the temporal side, but the nasal edges veiled.

Typical right lateral hemianopsia with moderate contraction of the preserved field, the contraction being relatively greater upon the right side. The central color perception was normal. The field of vision was taken with a square of white, 1 cm. in diameter. Three days later the patient died suddenly, with the clinical symptoms of a large apoplexy.

Certain broad distinctions can be made between cortical hemianopsia and those subcortical cases in which the lesion involves both the optic nerve and the internal capsule. In these the hemianopsia is associated with certain definite hemisymptoms, such as were present in the majority of cases here enumerated. The symptoms may vary considerably within certain limits. Sometimes both hemiplegia and hemi-

anæsthesia are present. Usually these conditions are partial; frequently one is present and the other is absent. Other hemisymptoms of somewhat frequent occurrence are ataxic chorea and monospasm or unilateral convulsions.

In some cases the paresis or paralysis is decidedly of a spastic type. In this group of cases the lesion is probably located at a position where the commissural-fibres, the optic radiations and the internal capsule come together, probably at a point in the centrum ovale near the junction of the parietal and occipital lobes. We do not believe that the thalamus is usually involved in these cases, although it may be in some instances. While we have no pathological disproof of this, we have evidence of a negative character in a marked case of hemianæsthesia of many years' standing, without hemianopsia, and in which the autopsy showed a large lesion of the thalamus, with moderate involvement of the internal capsule.

Double hemianopsia is rare, about thirteen cases being on record. These cases throw light on macular representation. Through the kindness of Dr. T. D. Dunn we have been enabled to study one case of this character, and we reproduce Dr. Dunn's report from the "University Magazine," May, 1895:

DOUBLE HEMIPLEGIA WITH DOUBLE HEMIANOPSIA AND LOSS OF GEOGRAPHICAL CENTRE.[1]

Dr. Dunn writes thus:

"The case which especially attracted my attention to the subject treated in this paper is a man of sixty-eight years, married, who has led an active life. His parents lived to be nearly seventy years old. Four or five older brothers and sisters, and three of his four children are living and healthy. He is not addicted to the use of alcoholic drinks, and there is no history of syphilis. He fancied a good horse, and rode and drove much.

"In 1888 he was thrown from his carriage and received several severe scalp wounds, but no fracture. He was unconscious for several hours. From this accident he completely recovered, although he was very nervous for several months.

"During the winter of 1890, while in Philadelphia, he had an attack of epidemic influenza, followed by pneumonia, and was then under the care of Dr. H. C. Wood. With the exception of the above, he had had no severe illness, though he frequently applied to me for attacks of acute indigestion, which always brought on violent cardiac palpitation. The pulse would become intermittent, irregular, and often 130 per minute. These attacks seldom lasted more than two days, and during the intervals the heart's action was fair. He had no dyspnœa, though there was

[1] Read by Dr. Dunn before the College of Physicians of Philadelphia, March 6, 1895.

mitral valvular disease with compensatory hypertrophy and general arterial hardening.

"On the morning of May 2, 1891, he came to my office with one of these attacks. Being more comfortable in a few hours, he took a drive of eight miles to dine with a country friend. He ate a hearty dinner, and shortly afterwards became unconscious.

"At 8 P. M., two hours after the attack, I found there was partial paralysis of the right leg, nearly complete paralysis of the right arm, slight drawing of face, and partial right hemianæsthesia. He was unable to articulate any words except 'yes' and 'no.' Cold applications to the head and a calomel purge were prescribed.

"The following day the movements of both arm and leg were improved, but he complained bitterly of pain in the head and eyes. Much relief was obtained from bromide and cups to the back of the neck.

"On the third day right lateral homonymous hemianopsia was discovered, which doubtlessly dated from the beginning of the attack. He recognized persons and objects, but could not name them; movement of the right side was much improved, and he complained less of numbness.

"At the end of ten days the hemiplegia had nearly disappeared, the facial expression was normal, and the hemianæsthesia scarcely perceptible; knee-jerks increased. His mind was clear and there was considerable increase in his vocabulary, but no improvement in the field of vision.

"In three weeks he was walking about as usual, and his general condition was as good as before the attack. Vision remained unchanged, and there was a slight tendency to bear to the left in walking. The aphasia slowly improved, though much trouble was found in recalling the names of things. With the exception of an occasional attack of indigestion, he enjoyed good health, and drove and rode as usual, though his use of names was never entirely restored, and there was no increase in the visual field.

"Dr. G. E. de Schweinitz examined the patient's eyes November 24, 1891, and supplied the following report:

"'*Vision* of the right eye $\frac{20}{XL}$, of the left eye $\frac{20}{XXX}$. With +3 D, 0.50 m. was read with each eye at thirty centimetres. The excursion of the eyes was good in all directions; there was no paresis of any of the external ocular muscle, no history of diplopia, and only slight insufficiency of the internal recti muscles with the ordinary tests.

"'*Ophthalmoscope—Right Eye.*—An irregularly oval optic disc, gray in its deeper layers, and bounded by a pigment crescent at the outer side; veins full and tortuous, arteries normal; general fundus in good condition and without signs of former disease.

"'*Left Eye.*—Irregularly oval, slightly gray, optic disc, edges a trifle prominent but clearly outlined; veins full, arteries normal; no abnormality in the retina or choroid.

"'*Field of Vision.*—Typical right lateral hemianopsia with contraction of the preserved fields, the relatively smaller half field being upon the right side. The dividing line between the preserved and the darkened fields passed, as is usual, slightly in advance of the fixing points. (Figs. 13 and 14.) Central color perception was normal.

"'*Pupils.*—Contraction of the iris to light was present equally when the beam

was thrown upon the blind and upon the seeing side of each retina. In other words, the hemianopic pupillary inaction was wanting, consequently the lesion which determined the hemianopsia was situated posterior to the primary optic centres. The pupils were round, equal in size, and the iris reactions normal in all other respects.'

"January 28, 1893, after eating imprudently, he had an attack of indigestion with the usual cardiac disturbance, and awakened the following morning with left hemiplegia and partial hemianæsthesia, associated with absolute blindness. Speech was not affected, but he was much worried over the loss of power in the left side and loss of sight, and he had no conception of where he was. Taste and smell were natural, voices were recognized, and his mind was only slightly affected.

"Four days afterwards, as after the first attack, there was rapid restoration of power and sensibility, but no improvement in vision or knowledge of locality. His mind was clear, and he would discuss his condition intelligently.

FIG. 13.

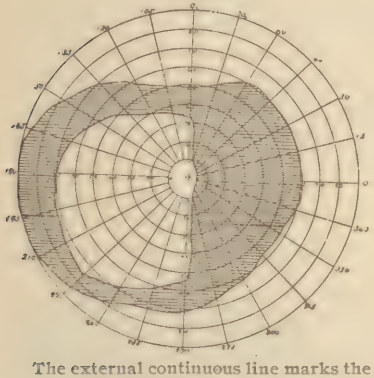
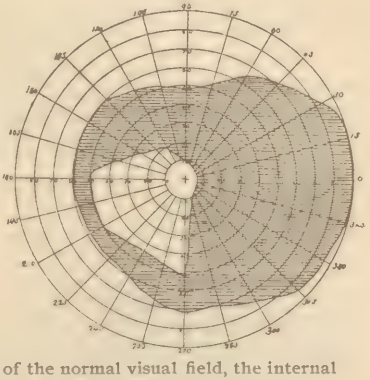


FIG. 14.



The external continuous line marks the boundary of the normal visual field, the internal continuous line the limits of the field in the case examined, the white area the region of preserved vision, the shaded area where vision was lost.

"On the eighth day he recognized light from a window, and when a candle was placed directly in front of him he saw it with each eye, but nothing could be distinguished in the room, and he could not recognize individuals except by their voices. He had much trouble in locating himself and his house—being unable to form a mental picture of any place.

"At the end of four weeks power and sensibility were restored, and he could walk, when led, as well as any blind man.

"With his reading glasses letters could be recognized at his usual reading distance, but only the smallest words could be seen without changing the position of his head. Of the word 'constantly,' in ordinary reading type, he could see six letters, but not the remaining four. He could, however, read slowly by taking in small words and parts of large ones. There was no improvement in the sense of locality. He could form no conception of the geography of his own house or of any place he had ever been. He could recollect that he lived on the corner of two streets and their names, but their relation to each other, or to other streets, was completely lost. He could not see enough of the sketches made of the floors of his own house to assist him in getting an idea of the relation of things. When a

place was named he could remember it, but its location or relation to other places was lost. He could recollect individuals by their voices, and could describe correctly their appearance.

"Dr. de Schweinitz examined the patient's eyes again April 19, 1893, when the following conditions were noted:

"'*Vision* of the right eye equalled one-half, that of the left also one-half of normal. With + 3 D ordinary newspaper print (pica and small pica) could be read very slowly, one word at a time, by holding the head in such position that the word corresponded exactly with the point of fixation. If the word was long, only a portion of it could be read at a time.

"'*Ophthalmoscope*.—The appearances of the optic nerve, bloodvessels and general fundus of each eye were the same as those noted in the previous examination, save only that the grayness in the deeper layers of the discs was more manifest, and there was slight blurring of the nasal edges of the nerve-heads.

"'*Field of Vision*.—The visual field in each eye was obliterated, with the exception of a small, irregularly oval patch directly in its centre, about ten degrees in the horizontal and slightly greater in the vertical diameter. In other words, there had been added to the previous condition a left lateral hemianopsia. The preservation of this small central field in each eye indicated that the region in the cortical visual centres which supplies the macula lutea had not been destroyed—another clinical demonstration of the special representation of the macula lutea in the cortex. (Figs. 15 and 16.)

FIG. 15.

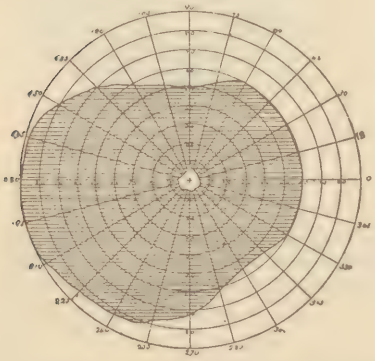
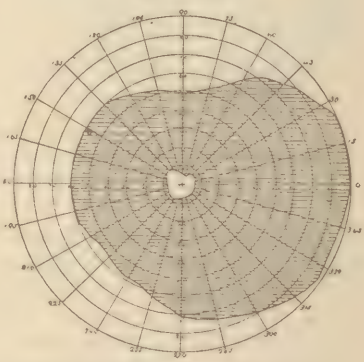


FIG. 16.



Diagrams of the visual fields after the second attack of hemianopsia. The small central white area represents the limits of the preserved field (macular vision); the shading, where vision was lost.

"'*Pupils*.—The iris reaction, when a beam of light was directed into the pupillary space so as to fall, if possible, on the macular region, was normal in each eye, although the response was less prompt or almost absent when the beam was thrown to either side of this position.

"'*Color-sense*.—This was practically lost; red gave the sensation of 'brass,' green that of 'gray-white,' yellow was called 'gold but not bright enough,' and blue was described as a color that 'might be purple.'"

"In January, 1895, he had another attack of pneumonia, not extensive, from which he recovered, but with weakened heart action and considerable dyspnœa.

"It is now (March 1, 1895) over two years since the second attack of hemiplegia. There is no perceptible improvement in the field of vision; there is a small central point which can recognize a pin on the floor, but he can see only short words at ordinary reading distance. Although he has driven over the town and walked about with an attendant almost daily, nothing has been gained of the lost sense of locality. Two points show slight improvement in this respect in his own home.

"After coming from a walk, if he is led to the front door and stands face inward, he can walk to a smoking-room at the opposite end of the thirty-foot hall; if, however, his face is turned outward, or even a quarter around, he cannot find his way. In his sitting-room, he fixes his position by the tick of the clock and can find his way out of one door to a bath-room, or out of another to the hall, where the banister enables him to descend the stairs to the dining-room. The aphasia has nearly disappeared, though some words are still recalled with difficulty.

"His general condition is fair, and he discusses his case with much interest and intelligence."[1]

A very few cases have been put on record in which one-half or a portion of the macular field has been affected.

We have notes, somewhat imperfect, of an unpublished case which would seem to teach us that we may have either functional or organic disturbance of the word-symbol centre of the same character as that which produces hemianopsia when the half centre for general vision is destroyed on one side of the brain.

This patient was an educated man, engaged in scientific work, and had been troubled for many years with flying specks and one dark spot. When sitting, the flying bodies went downward from above; turning his head from side to side, they fell to either side, according to the direction in which his head was moved. On closing his eyes he often had phosphenes—a multitude of little, bright bodies, like blood-corpuscles in size, upon an orange field. He was highly hyperopic, but did not wear spectacles until he was forty years old. He had been a close student, frequently using the microscope.

The peculiar half vision with which he suffered at times consisted in the right half of a word disappearing or becoming blank while he was reading. For example: in the word "capacity," the letters "acity" would suddenly be blotted out. All around the obliterated letters he could see words and objects, but indistinctly. The trouble was the same with both eyes open or with either eye shut; the right half of the word was blotted out for the right eye, the left eye for both. By twisting or moving his head, so as to bring his eyes along to the right, he could pursue his reading, the blank space receding towards the right. (Noyes.)

[1] Since this was written the patient has died; autopsy was refused.